ORDINANCE NO. 5382

AN ORDINANCE OF THE COUNCIL OF THE CITY OF SANTA BARBARA AMENDING SANTA BARBARA MUNICIPAL CODE SECTION 22.04.020 REGARDING AMENDMENTS TO THE CALIFORNIA BUILDING CODE (2001 EDITION)

WHEREAS, the City of Santa Barbara adopted the provisions of the 2001 California Building Code subject to certain amendments based upon local geological, topographic, and climatic conditions;

WHEREAS, the California Building Standards Commission recently amended building standards for all buildings owned by the State of California as authorized by California Health and Safety Code Section 18934.5;

WHEREAS, the California Building Standards Commission made these amendments pursuant to a "Finding of Emergency," and made the following findings:

1. Recent major earthquakes have proven that there are shortcomings in the current standards;
2. The current published standards do not include major advancements in the field of seismic design;
3. Approval of the proposed standards will provide for higher public safety in the event of a large earthquake; and
4. The proposed standards will significantly reduce loss of life and economic hardship after a major quake. The changes were intended to improve structural safety during earthquakes pursuant to a finding of emergency Express Terms of Proposed Building Standards;

WHEREAS, California Health & Safety Code Section 17958.5 authorizes cities to modify the California Building Standards Code by adopting more restrictive standards and modifications if such standards and modifications are accompanied by express findings that they are reasonably necessary because of local climatic, geological or topographical conditions; and

WHEREAS, the City of Santa Barbara is situated over numerous faults capable of generating damage-producing earthquakes as identified in the Seismic Safety Element portion of the City's General Plan. These are the Mission Ridge Fault, the Mesa Fault, the Lavigia Fault and the More Ranch Fault. Additionally, the City is also situated near the Santa Ynez Fault to the north, the Red Mountain Fault to the south, and the Los Alamos Fault to the southeast. The San Andreas Fault located to the east is also a major fault that may affect the City. Since any of these faults are capable of becoming active at any time, the City of Santa Barbara is particularly vulnerable to devastation should an earthquake occur. The potential effects include isolating the City of Santa Barbara due to bridge and freeway overpass and/or tunnel collapse. Additional

potential situations inherent in such an occurrence include broken natural-gas mains causing structure and other fires, leakage of hazardous materials, the need for rescues from collapsed structures, and the rendering of first aid and other medical attention to large numbers of people. The protection of human life and the preservation of property in the event of such an occurrence support the imposition of building requirements greater than those set forth in the 2001 California Building Code and in particular support the imposition of greater requirements set forth by the California Building Standards Commission in the amended Sections 213, 1612.3.2.1, 1629.4.2.1, 1630.2.3.4, 1630.2.3.5, 1630.4.2.1, 1630.8.2.1.1, 1630.8.2.2.1, Table 16-N, 1701.5.5.2.1, 1702.1, 1703.1, 1915.2.2.1, 1928.1.2.3.1, 2204.1.1, 2204.2.1, Chapter 22B, 2315.5.6, and Table 23-II-L.

NOW, THEREFORE, THE COUNCIL OF THE CITY OF SANTA BARBARA DOES ORDAIN AS FOLLOWS:

SECTION 1. Chapter 22.04 of the Santa Barbara Municipal Code is hereby amended to read as follows:

22.04.020 Amendments to the Uniform Codes

The Uniform Codes adopted by reference pursuant to this Chapter are amended as set forth in Section 2 of Ordinance No. 5256, Section 2 of Ordinance No. 5336, Section 2 of Ordinance No. 5365, and Section 2 of Ordinance ____.

SECTION 2. The 2001 California Building Code adopted by reference by Municipal Code Chapter 22.04 is amended as follows:

A. Section 213 "L" Definitions is amended by adding a definition which reads as follows:

Light-Frame Construction is a type of construction whose vertical and horizontal structural elements are primarily framed by a system of repetitive wood or light gauge steel framing members, and which does not use structural concrete as floor or roof diaphragm.

B. Section 1612.3.2.1 Alternate basic load combinations is added as follows:

In lieu of the basic load combinations specified in Section 1612.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following load combinations. When using these alternate basic load combinations, a one-third increase shall be permitted in allowable stresses for all combinations including W or E but not concurrent with the duration of load increase permitted in Division III of Chapter 23.

D + L + (Lr or S)	(12-12)
D + L + (W or E/1.4)	(12-13)
D + L + W + S/2	(12-14)
D + L + S + W/2	(12-15)
D + L + S + E/1.4	(12-16)
0.9D ± E/1.4	(12-16-1)

EXCEPTIONS:

1. Crane hook loads need not be combined with roof live load or with more than three fourths of the snow load or one half of the wind load.

2. Design snow loads of 30 psf (1.44 kN/m^2) or less need not be combined with seismic loads. Where design snow loads exceed 30 psf (1.44 kN/m^2), the design snow load shall be included with seismic loads, but may be reduced up to 75 percent where consideration of siting, configuration and load duration warrant when approved by the building official.

C. Section 1629.4.2.1 Seismic Zone 4 near-factor source is added as follows:

In Seismic Zone 4, each site shall be assigned a near-source factor in accordance with Table 16-S and the Seismic Source Type set forth in Table 16-U. The value of N_a used in determining C_a need not exceed 1.1 for structures complying with all the following conditions:

1. The soil profile type is S_A, S_B, S_C or S_D.

2. $\rho = 1.0$.

3. Except in single-story structures, Group R, Division 3 and Group U, Division 1 Occupancies, moment frame systems designated as part of the lateral-force-resisting system shall be special moment-resisting frames.

4. The provisions in Sections 9.6a and 9.6b of AISC - Seismic Part 1 shall not apply, except for columns in one-story buildings or columns at the top story of multistory buildings.

5. None of the following structural irregularities is present: Type 1, 4 or 5 of Table 16-L, and Type 1 or 4 of Table 16-M.

D. Section 1630.2.3.4 Applicability is renumbered as Section 1630.2.3.5.

E. Section 1630.2.3.4 Horizontal Distribution is added as follows:

Diaphragms constructed of untopped steel decking or wood structural panels or similar light-frame construction are permitted to be considered as flexible.

F. Section 1630.4.2.1 Vertical Combinations is added as follows:

The value of R used in the design of any story shall be less than or equal to the value of R used in the given direction for the story above.

EXCEPTION: This requirement need not be applied to a story where the dead weight above that story is less than 10 percent of the total dead weight of the structure.

Structures may be designed using the procedures of this section under the following conditions:

1. The entire structure is designed using the lowest R of the lateral-force-resisting systems used, or

2. The following two-stage static analysis procedures may be used for structures conforming to Section 1629.8.3, Item 4.

2.1 The flexible upper portion shall be designed as a separate structure, supported laterally by the rigid lower portion, using the appropriate values of R and ρ.

2.2 The rigid lower portion shall be designed as a separate structure using the appropriate values of R and ρ. The reactions from the upper portion shall be those determined from the analysis of the upper portion multiplied by the ratio of the (R/ρ) of the upper portion over (R/ρ) of the lower portion. This ratio shall not be taken less than 1.0.

G. Section 1630.8.2.1.1 General is added as follows:

Where any portion of the lateral-load-resisting system is discontinuous, such as for vertical irregularity Type 4 in Table 16-L or plan irregularity Type 4 in Table 16-M, concrete, masonry, steel and wood elements (i.e. columns, beams, trusses or slabs) supporting such discontinuous systems shall have the design strength to resist the combination loads resulting from the special seismic load combinations of Section 1612.4. The Connections of such discontinuous elements to the supporting members shall be adequate to transmit the forces for which the discontinuous elements were

required to be designed.

EXCEPTIONS:

1. The quantity E_m in Section 1612.4 need not exceed the maximum force that can be transferred to the element by the lateral-force-resisting system.

2. Concrete slabs supporting light-frame wood shear wall systems or light-frame steel and wood structural panel shear wall systems.

For Allowable Stress Design, the design strength may be determined using an allowable stress increase of 1.7 and a resistance factor, Φ, of 1.0. This increase shall not be combined with the one-third stress increase permitted by Section 1612.3, but may be combined with the duration of load increase permitted in Chapter 23, Division III.

H. Section 1630.8.2.2 .1 Detailing Requirements in Seismic Zones 3 and 4 is added as follows:

In Seismic Zones 3 and 4, elements supporting discontinuous systems shall meet the following detailing or member limitations:

1. Reinforced concrete or reinforced masonry elements designed primarily as axial-load members shall comply with Section 1921.4.4.5.

2. Reinforced concrete elements designed primarily as flexural members and supporting other than light-frame wood shear wall systems or light-frame steel and wood structural panel shear wall systems shall comply with Sections 1921.3.2 and 1921.3.3. Strength computations for portions of slabs designed as supporting elements shall include only those portions of the slab that comply with the requirements of these

Sections.

3. Masonry elements designed primarily as axial-load carrying members shall comply with Sections 2106.1.12.4, Item 1, and 2108.2.6.2.6.

4. Masonry elements designed primarily as flexural members shall comply with Section 2108.2.6.2.5.

5. Steel elements designed primarily as flexural members or trusses shall have bracing for both top and bottom beam flanges or chords at the location of the support of the discontinuous system and shall comply with the requirements of AISC-Seismic Part I, Section 9.4b.

6. Wood elements designed primarily as flexural members shall be provided with lateral bracing or solid blocking at each end of the element and at the connection location(s) of the discontinuous systems.

I. Table 16-N Structural Systems is added as follows:

TABLE 16-N – STRUCTURAL SYSTEMS[1]

BASIC STRUCTURAL SYSTEM[2]	LATERAL FORCE RESISTING SYSTEM DESCRIPTION	R	Ω_o	HEIGHT LIMIT FOR SEISMIC ZONES 3 AND 4
1. Bearing Wall System	1. Light-framed walls with shear panel			
	a. Wood structural panel walls for structures three stories or less	5.5	2.8	65
	b. All other light-framed walls	4.5	2.8	65
	2. Shear walls			
	a. Concrete	4.4	2.8	160
	b. Masonry	2.8	2.8	160
	3. Light steel-framed bearing walls with tension-only bracing	2.8	2.2	65
	4. Braced framed bearing walls where bracing carries gravity load			

	a. Steel[6] b. Concrete c. Heavy timber	4.4 2.8 2.8	2.2 2.2 2.2	160 - 65
2. Building frame system	1. Steel eccentrically braced frame (EBF) 2. Light-framed walls with shear panel a. Wood structural panel walls for structures three stories or less b. All other light-framed walls 3. Shear walls a. Concrete b. Masonry 4. Ordinary braced frames a. Steel [6] b. Concrete[3] c. Heavy timber 5. Special concentrically braced frames a. Steel	7.0 6.5 5.0 5.5 5.5 5.0 5.6 5.6 6.4	2.8 2.8 2.8 2.8 2.8 2 - 2.2 2.2	240 65 65 240 160 35[6] 65 240
3. Moment-resisting frame system	1. Special moment-resisting frame (SMRF) a. Steel b. Concrete[4] 2. Masonry moment-resisting wall frame (MMRWF) 3. Intermediate moment-resisting frame (IMRF) a. Steel[6] b. Concrete[5] 4. Ordinary moment-resisting frame (OMRF) a. Steel [6] b. Concrete [8] 5. Special truss moment frames of steel (STMF)	 8.5 8.5 6.5 4.5 5.5 3.5 3.5 6.5	 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8	 N.L. N.L. 160 35[6] - -[6.2] - 240

4. Dual systems	1. Shear walls			
	a. Concrete with SMRF	8.5	2.8	N.L.
	b. Concrete with steel OMRF (Not Permitted)	4.2	2.8	160
	c. Concrete with concrete IMRF [5]	6.5	2.8	160
	d. Masonry with SMRF	5.5	2.8	160
	e. Masonry with steel OMRF (Not Permitted)	4.2	2.8	160
	f. Masonry with concrete IMRF [3]	4.2	2.8	-
	g. Masonry with masonry MMRWF	6.0	2.8	160
	2. Steel EBF			
	a. With steel SMRF	8.5	2.8	N.L.
	b. With steel OMRF (Not Permitted)	4.2	2.8	160
	3. Ordinary braced frames (Not Permitted)	6.5	2.8	N.L.
	a. Steel with steel SMRF	4.2	2.8	160
	b. Steel with steel OMRF	6.5	2.8	-
	c. Concrete with concrete SMRF[3]	4.2	2.8	-
	d. Concrete with concrete IMRF[3]			
	4. Special concentrically braced frames	7.5	2.8	N.L.
	a. Steel with steel SMRF	4.2	2.8	160
	b. Steel with steel OMRF (Not Permitted)			
	5. Steel IMRF (Not permitted)			
5. Cantilevered column building systems	1. Cantilevered column elements	2.2	2.0	35[7]
6. Shear wall-frame interaction systems	1. Concrete[8]	5.5	2.8	160
7. Undefined systems	See Section 1629.6.7 and 1629.9.2	-	-	-

N.L.– no limit

[1] See Section 1630.4 for combination of structural systems.

[2] Basic structural systems are defined in Section 1629.6.

[3] Prohibited in Seismic Zones 3 and 4.

[4] Includes precast concrete conforming to Section 1921.2.7.

[5] Prohibited in Seismic Zones 3 and 4, except as permitted in Section 1634.2.

[6] Unless otherwise approved by the enforcement agency, in Seismic Zone 4 :

[6.1] Steel IMRF are permitted for buildings 35 ft. or less in height and the dead load of the roof, walls or floors not exceeding 35 psf each; or for single-story buildings 60 ft. or less in height with dead load of the roof or walls not exceeding 15 psf each where the moment joints of field connections are constructed of bolted end plates; or single-family dwellings using light frame construction with R = 3.0 and Ωo = 2.2.

[6.2] Steel OMRF are permitted for buildings 35 ft or less in height with the dead load of the roof, walls or floors not exceeding 15 psf each; or single-story buildings 60 ft or less in height with the dead load of the roof or walls not exceeding 15 psf each and where the moment joints of field connections are constructed of bolted end plates.

[6.3] Steel Ordinary Braced Frames are permitted for buildings 35 ft or less in height; or penthouse structures; or single-story buildings 60 ft or less in height with the dead load of the roof or walls not exceeding 15 psf. each.

[7] Total height of the building including cantilevered columns.

[8] Prohibited in Seismic Zones 2A, 2B, 3 and 4. See Section 1633.2.7.

J. Section 1701.5.5.2.1 Lateral Force Resisting Steel Frames is added as follows:

During the welding of lateral force resisting steel frames. In addition to Item 5.1 requirements, nondestructive testing as required by Section 1703 of this code.

K. Section 1702.1 Structural Observation is added as follows:

Structural observation shall be provided in Seismic Zone 3 or 4 when one of the following conditions exists:

1. The structure is defined in Table 16-K as Occupancy Category I, II or III,
2. The structure is required to comply with Section 403

3. The structure is in Seismic Zone 4 and a lateral design is required for the entire structure.

EXCEPTION: One- and two-story wood framed Group R, Division 3, B, F, M and S Occupancies provided the adjacent grade is not steeper than 1 unit vertical in 10 units horizontal (10% sloped).

4. When so designated by the architect or engineer of record, or

5. When such observation is specifically required by the building official.

The owner shall employ the engineer or architect responsible for the structural design, or another engineer or architect designated by the engineer or architect responsible for the structural design to perform structural observation as defined in Section 220.

The owner or owner's representative shall coordinate and call a pre-construction meeting between the engineer or architect responsible for the structural design, structural observer, contractor, affected subcontractors and deputy inspectors. The structural observer shall preside over the meeting. The purpose of the meeting shall be to identify the major structural elements and connections that affect the vertical and lateral load systems of the structure and to review scheduling of the required observations. A record of the meeting shall be included in the first report submitted to the building official.

Observed deficiencies shall be reported in writing to the owner's representative, special inspector, contractor and the building official. Upon the form prescribed by the building official, the structural observer shall submit to the building official a written statement at each significant construction stage stating that the site visits have been

made and identifying any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved. A final report by the structural observer which states that all observed deficiencies have been resolved is required before acceptance of the work by the building official.

L. Section 1703.1 Nondestructive Testing is added as follows:

In Seismic Zones 3 and 4, welded connections between the primary members of lateral force resisting frames, which are subject to net tensile forces shall be tested by nondestructive methods in accordance with AISC-Seismic Part I Section 16 for compliance with approved standards and job specifications. This testing shall be a part of the special inspection requirements of Section 1701.5. A program for this testing shall be established by the person responsible for structural design and as shown on plans and specifications.

As a minimum, this program shall include the following:

1. All complete penetration groove welds contained in joints and splices shall be tested 100 percent either by ultrasonic testing or by radiography.

EXCEPTIONS:

1. When approved, nondestructive testing rate for an individual welder or welding operator may be reduced to 25 percent, provided the reject rate is demonstrated to be 5 percent or less of the welds tested for the welder or welding operator. A sampling of at least 40 completed welds for a job shall be made for such reduction evaluation. Reject rate is defined as the number of welds containing rejectable defects divided by the number of welds completed. For evaluating reject rate of continuous welds over 3 feet (914 mm) in length where

the effective throat thickness is 1 inch (25 mm) or less, each 12-inch increment (305 mm) or fraction thereof shall be considered as one weld. For evaluating the reject rate on continuous welds over 3 feet (914 mm) in length where the effective throat thickness is greater than 1 inch (25 mm), each 6 inches (152 mm) length of fraction thereof shall be considered one weld. 2. For complete penetration groove welds on materials less than 5/16 inch (7.9 mm) thick, nondestructive testing is not required; for this welding, continuous inspection is required. 3. When approved by the building official and outlined in the project plans and specification, this nondestructive ultrasonic testing may be performed in the shop of an approved fabricator utilizing qualified test techniques in the employment of the fabricator.

2. Partial penetration groove welds when used in column splices shall be tested either by ultrasonic testing or radiography when required by the plans and specifications. For partial penetration groove welds when used in column splices, with an effective throat less than ¾ inch (19.1 mm) thick, nondestructive testing is not required; for this welding, continuous special inspection is required.

3. Base metal thicker than 1 ½ inches (38 mm), when subjected to through-thickness weld shrinkage strains, shall be ultrasonically inspected for discontinuities directly behind such welds after joint completion.

Any material discontinuities shall be accepted or rejected on the basis of the defect rating in accordance with the (larger reflector) criteria of approved national standards.

M. Section 1915.2.2.1 is added as follows:

Base area of footing or number and arrangement of piles shall be determined from the external forces and moments (transmitted by footing to soil or piles) and permissible soil pressure or permissible pile capacity selected through principles of soil mechanics. External forces and moments are those resulting from the load combinations of 1612.3.

N. Section 1928.1.2.3.1 Basic Combinations is added as follows:

When permitted by Section 1928.1, structures, components and foundations shall be designed so that their design strength exceeds the effects of the factored loads in the following combinations:

1. 1.4D
2. $1.2D + 1.6L + 0.5(L_r \text{ or } S \text{ or } R)$
3. $1.2D + 1.6(L_r \text{ or } S \text{ or } R) + (0.5L \text{ or } 0.8W)$
4. $1.2D \pm 1.3W + 0.5L + 0.5(L_r \text{ or } S \text{ or } R)$
5. $1.2D \pm 1.0E + (0.5L \text{ or } 0.2S)$
6. $0.9D \pm (1.3W \text{ or } 1.0E)$

EXCEPTIONS:

1. The load factor on L in combinations 3, 4 and 5 shall equal 1.0 for garages, areas occupied and places of public assembly, and all areas where the live load is greater than 100 lb./ft^2 (pounds-force per square foot) (4.79 kPa).

2. Each relevant strength limit state shall be considered. The most unfavorable effect may occur when one or more of the contributing loads are not acting.

O. Section 2204.1.1 Load and Resistance Factor Design is added as follows:

Steel design based on load and resistance factor design method shall resist the factored load combinations of section 1612.2 in accordance with the applicable requirements of section 2205.

P. Section 2204.2.1 Allowable Stress Design is added as follows:

Steel design based on allowable stress design methods shall resist the factored load combinations of section 1612.3 in accordance with the applicable requirements of section 2205.

Q. Chapter 22B Steel is amended by deleting the word "[BSC]" from the entire chapter.

R. Section 2315.5.6 Hold-down connectors is added as follows:

Hold-down connector bolts into wood framing require steel plate washers in accordance with Table 23-II-L. Hold-downs shall be retightened just prior to covering the wall framing.

S. Table 23-II-L Minimum Size Steel Plate Washers Used With Hold-down Connectors is added as follows:

BOLT SIZE (x25.4 for mm)	PLATE SIZE (x25.4 for mm)
1/2" [1]	3/16" x 2" x 2"
5/8"	3/16" x 2-1/2" x 2-1/2"
3/4"	5/16" x 2-3/4" x 2-3/4"
7/8"	5/16" x 3" x 3"
1"	3/8" x 3-1/2" x 3-1/2"

[1] 1/2" anchor bolts are not permitted for wood plates or sill plates per Section 1806.6

SECTION 3: These amendments to the uniform codes adopted by the State of California are adopted by the City of Santa Barbara in consideration of the local special climatic, topographic, and geologic conditions in the Santa Barbara area.

SECTION 4: Whenever in this Ordinance or in any of the codes adopted by reference hereby, another code or publication of standards or of rules or regulations is referred to, such reference shall incorporate and adopt by reference such other codes, standards or rules or regulations as part of this ordinance. A copy of said primary and secondary codes are on file and shall be maintained for public inspection by the Chief Building Official as provided in Title 5, Division 1, Part 1, Chapter 1 of the California Government Code while this Ordinance is in force.

ORDINANCE NO. 5382

STATE OF CALIFORNIA)
)
COUNTY OF SANTA BARBARA) ss.
)
CITY OF SANTA BARBARA)

I HEREBY CERTIFY that the foregoing ordinance was introduced on December 6, 2005, and was adopted by the Council of the City of Santa Barbara at a meeting held on December 13, 2005, by the following roll call vote:

AYES: Councilmembers Brian B. Barnwell, Iya G. Falcone, Roger L. Horton, Helene Schneider, Dan B. Secord, Das Williams; Mayor Marty Blum

NOES: None

ABSENT: None

ABSTENTIONS: None

IN WITNESS WHEREOF, I have hereto set my hand and affixed the official seal of the City of Santa Barbara on December 14, 2005.

Cynthia M. Rodriguez, CMC
City Clerk Services Manager

I HEREBY APPROVE the foregoing ordinance on December 14, 2005.

Marty Blum
Mayor